

### Abstract

5 A novel device and method for characterization of molecules is provides that improves characterization accuracy by utilizing larger numbers of reactive molecules that are smaller or shorter in chain length for the analysis procedure. Modification of markers such as nanotubes form nanotube assemblies that are easily detected using a number of surface analysis devices such as AFM and STM. The novel method shown using carbon nanotubes to mark a signature on reactive molecules permits a larger distribution and smaller molecule size of reactive molecules used in characterization of a sample molecule. The modification of the carbon nanotubes allows the characterization procedure to detect the nanotube markers more easily, thus decreasing characterization errors, and allowing faster characterization speeds.

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